

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method for the treatment of a human or animal subject comprising administering to the subject within 24 hours of the onset of an ischemic stroke event an amount of a glycogen synthase kinase 3 (GSK3) inhibitor effective to reduce or prevent ischemic injury in the subject.
2. A method of Claim 1 wherein the GSK3 inhibitor is administered to the subject within 8 hours of the onset of the ischemic stroke event.
3. A method of Claim 1 wherein the GSK3 inhibitor is administered to the subject within 2 hours of the onset of the ischemic stroke event.
4. A method of Claim 1 wherein the GSK3 inhibitor is administered to the subject intermittently or continuously for at least 24 hours.
5. A method of Claim 1 wherein the GSK3 inhibitor has a molecular weight below about 800.
6. A method of Claim 1 wherein the GSK3 inhibitor has a molecular weight below about 500.
7. A method of Claim 1 wherein the GSK3 inhibitor has a molecular weight below about 400.
8. A method of Claim 1 wherein the GSK3 inhibitor has a log P in the range of about 0 to 8.
9. A method of Claim 1 wherein the GSK3 inhibitor has a log P in the range of about 1 to 6.

10. A method of Claim 1 wherein the GSK3 inhibitor has a log P in the range of about 2 to 5.

11. A method of Claim 1 wherein the GSK3 inhibitor is administered to the subject in combination with at least one additional agent for the treatment of ischemic stroke.

12. A method of Claim 11 wherein the additional agent for the treatment of ischemic stroke is selected from the group consisting of thrombolytic agents, fibrinolytic agents, neuroprotective agents, anticoagulants and antiplatelet agents.

13. A method of Claim 11 wherein the additional agent for the treatment of ischemic stroke is a thrombolytic agent selected from the group consisting of alteplase, anistreplase, reteplase, urokinase and streptokinase.

14. A method of Claim 11 wherein the additional agent for the treatment of ischemic stroke is a neuroprotective agent selected from the group consisting of caspase inhibitors, glutamate antagonists, calcium antagonists, opiate antagonists, GABA-A agonists, calpain inhibitors, NMDA receptor antagonists, K⁺ channel modulators, PDH kinase inhibitors, and antioxidants.

15. A method of Claim 11 wherein the additional agent for the treatment of ischemic stroke is an anticoagulant selected from the group consisting of heparin, warfarin, dalteparin, danaparoid, enoxaparin, tinzaparin, 4-hydroxycoumarin, dicumarol, phenprocoumon, acenocoumarol, anisindone, lepirudin and indane-1,3-dione.

16. A method of Claim 11 wherein the additional agent for the treatment of ischemic stroke is an antiplatelet agent selected from the group consisting of aspirin, clopidogrel, ticlopidine, abciximab, eptifibatide, tirofiban and dipyridamole.

17. A method for treating cerebrovascular ischemic disorders in a human or animal subject in need of such treatment comprising administering to said subject an amount of a glycogen synthase kinase 3 (GSK3) inhibitor effective to reduce or prevent ischemic injury in the subject in combination with at least one additional agent for the treatment of ischemic stroke.

18. A method of Claim 17 wherein the glycogen synthase kinase 3 (GSK3) inhibitor is administered to the subject prior to administration of the at least one additional agent.

19. A method of Claim 17 wherein the glycogen synthase kinase 3 (GSK3) inhibitor is administered to the subject concurrently with administration of the at least one additional agent.

20. A method of Claim 17 wherein the glycogen synthase kinase 3 (GSK3) inhibitor is administered to the subject prior to and concurrently with administration of the at least one additional agent.

21. A method of Claim 17 wherein the GSK3 inhibitor is administered to the subject within 24 hours of the onset of an ischemic stroke event in the subject.

22. A method of Claim 17 wherein the GSK3 inhibitor is administered to the subject within 8 hours of the onset of an ischemic stroke event in the subject.

23. A method of Claim 17 wherein the GSK3 inhibitor is administered to the subject within 2 hours of the onset of an ischemic stroke event in the subject.

24. A method of Claim 17 wherein the GSK3 inhibitor is administered to the subject intermittently or continuously for at least 24 hours.

25. A method of Claim 17 wherein the GSK3 inhibitor has a molecular weight below about 800.

26. A method of Claim 17 wherein the GSK3 inhibitor has a molecular weight below about 500.

27. A method of Claim 17 wherein the GSK3 inhibitor has a molecular weight below about 400.

28. A method of Claim 17 wherein the GSK3 inhibitor has a log P in the range of about 0 to 8.

29. A method of Claim 17 wherein the GSK3 inhibitor has a log P in the range of about 1 to 6.

30. A method of Claim 17 wherein the GSK3 inhibitor has a log P in the range of about 2 to 5.

31. A method of Claim 17 wherein the additional agent for the treatment of ischemic stroke is selected from the group consisting of thrombolytic agents, fibrinolytic agents, neuroprotective agents, anticoagulants and antiplatelet agents.

32. A method of Claim 31 wherein the additional agent for the treatment of ischemic stroke is a thrombolytic agent selected from the group consisting of alteplase, anistreplase, reteplase, urokinase and streptokinase.

33. A method of Claim 31 wherein the additional agent for the treatment of ischemic stroke is a neuroprotective agent selected from the group consisting of caspase inhibitors, glutamate antagonists, calcium antagonists, opiate antagonists, GABA-A agonists, calpain inhibitors, NMDA receptor antagonists, K⁺ channel modulators, PDH kinase inhibitors, and antioxidants.

34. A method of Claim 31 wherein the additional agent for the treatment of ischemic stroke is an anticoagulant selected from the group consisting of heparin, warfarin, dalteparin, danaparoid, enoxaparin, tinzaparin, 4-hydroxycoumarin, dicumarol, phenprocoumon, acenocoumarol, anisindone, lepirudin and indane-1,3-dione.

35. A method of Claim 31 wherein the additional agent for the treatment of ischemic stroke is an antiplatelet agent selected from the group consisting of aspirin, clopidogrel, ticlopidine, abciximab, eptifibatide, tirofiban and dipyridamole.

36. A composition comprising a GSK3 inhibitor and at least one additional agent for the treatment of ischemic stroke.

37. A composition of Claim 36 wherein the GSK3 inhibitor has a molecular weight below about 800.

38. A composition of Claim 36 wherein the GSK3 inhibitor has a molecular weight below about 500.

39. A composition of Claim 36 wherein the GSK3 inhibitor has a molecular weight below about 400.

40. A composition of Claim 36 wherein the GSK3 inhibitor has a log P in the range of about 0 to 8.

41. A composition of Claim 36 wherein the GSK3 inhibitor has a log P in the range of about 1 to 6.

42. A composition of Claim 36 wherein the GSK3 inhibitor has a log P in the range of about 2 to 5.

43. A composition of Claim 36 wherein the additional agent for the treatment of ischemic stroke is selected from the group consisting of thrombolytic agents, fibrinolytic agents, neuroprotective agents, anticoagulants and antiplatelet agents.

44. A composition of Claim 36 wherein the additional agent for the treatment of ischemic stroke is a thrombolytic agent selected from the group consisting of alteplase, anistreplase, reteplase, urokinase and streptokinase.

45. A composition of Claim 44 wherein the additional agent for the treatment of ischemic stroke is a neuroprotective agent selected from the group consisting of caspase inhibitors, glutamate antagonists, calcium antagonists, opiate antagonists, GABA-A agonists, calpain inhibitors, NMDA receptor antagonists, K⁺ channel modulators, PDH kinase inhibitors, and antioxidants.

46. A composition of Claim 44 wherein the additional agent for the treatment of ischemic stroke is an anticoagulant selected from the group consisting of heparin, warfarin, dalteparin, danaparoid, enoxaparin, tinzaparin, 4-hydroxycoumarin, dicumarol, phenprocoumon, acenocoumarol, anisindone, lepirudin and indane-1,3-dione.

47. A composition of Claim 44 wherein the additional agent for the treatment of ischemic stroke is an antiplatelet agent selected from the group consisting of aspirin, clopidogrel, ticlopidine, abciximab, eptifibatide, tirofiban and dipyridamole.

48. The use of a GSK3 inhibitor in the manufacture of a medicament for the treatment of cerebrovascular ischemic disorders.

49. A method of Claim 1 wherein the GSK3 inhibitor is administered by a route selected from the group consisting of oral, subcutaneous, transdermal, transmucosal, iontophoretic, intracerebral, intravenous, intraarterial, intramuscular, intraperitoneal, intranasal, intrathecal, subdural, and rectal routes of administration.

50. A method of Claim 49 wherein the GSK3 inhibitor is administered systemically.

51. A method of Claim 49 wherein the GSK3 inhibitor is administered intracerebrally.

52. A method of Claim 49 wherein the GSK3 inhibitor is administered intrathecally.

53. A method of Claim 17 wherein the GSK3 inhibitor is administered by a route selected from the group consisting of oral, subcutaneous, transdermal, transmucosal, iontophoretic, intracerebral, intravenous, intraarterial, intramuscular, intraperitoneal, intranasal, intrathecal, subdural, and rectal routes of administration.

54. A method of Claim 53 wherein the GSK3 inhibitor is administered systemically.

55. A method of Claim 53 wherein the GSK3 inhibitor is administered intracerebrally.

56. A method of Claim 53 wherein the GSK3 inhibitor is administered intrathecally.